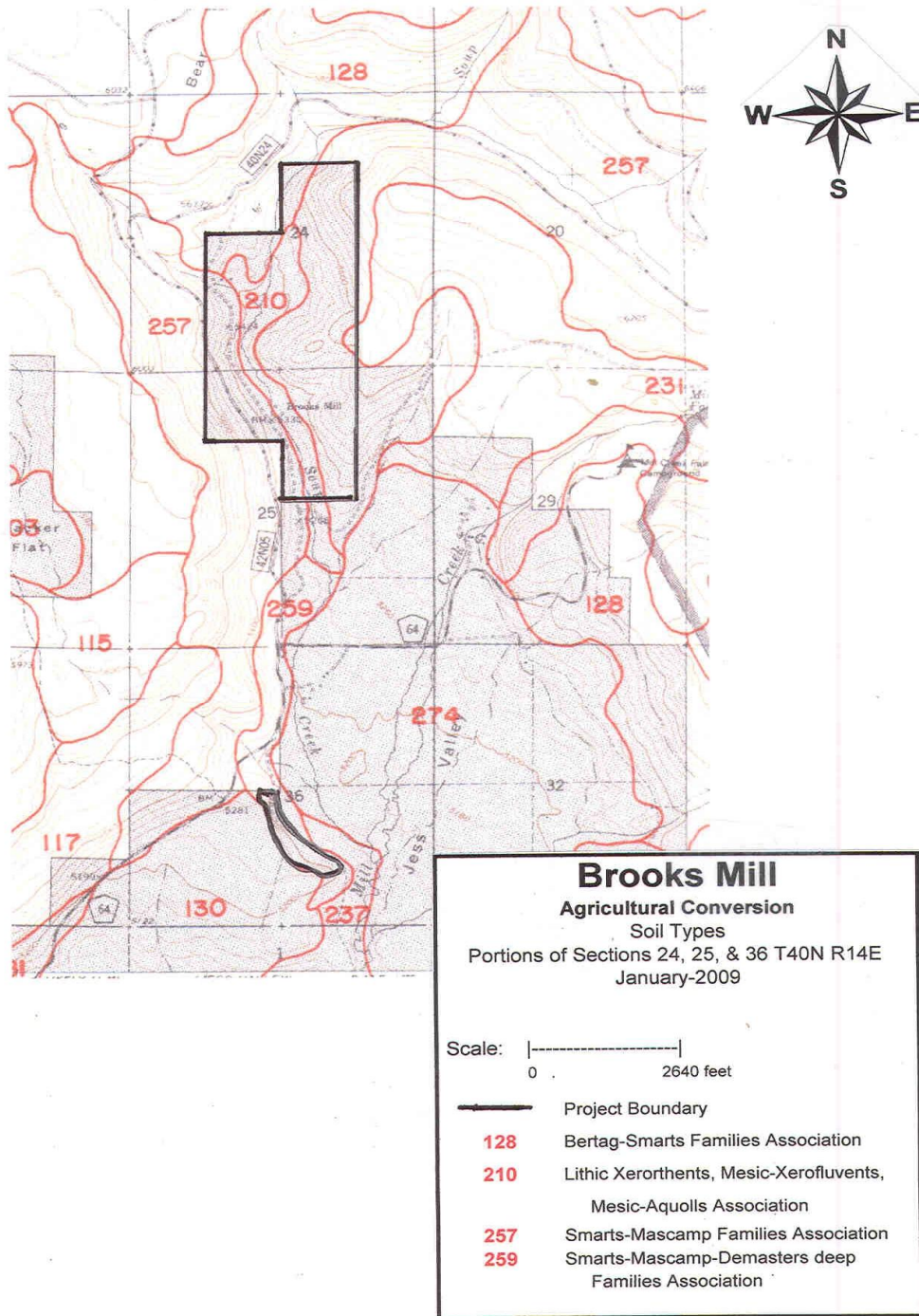


Appendix C

Soils Map and Characteristics

Soil information is from the “**Soil Survey of Modoc National Forest Area, California**” by the United States Department of Agriculture Forest Service and Soil Conservation Service.



128 BERTAG-SMARTS FAMILIES ASSOCIATION, 10 to 40 percent slopes		
Map Unit Components	Bertag family (40 percent)	Smarts family, (35 percent)
Position, Slope, and Elevation	On toeslopes and lower sideslopes of mountain uplands; 10 to 35 percent slopes; 5500 to 6500 feet.	On sideslopes, ridges and knolls of mountain uplands; 10 to 40 percent slopes; 5500 to 6500 feet.
Typical Vegetation and Precipitation (ppt)	White fir forest, or mixed conifer forest of white fir and ponderosa pine, plus snowbrush serviceberry, lupine, Ross's sedge, few grasses; 20 to 30 inches ppt.	White fir forest, or mixed conifer forest of white fir, ponderosa pine, incense-cedar, plus few juniper, serviceberry, snowberry, mountain mahogany, Ross's sedge, few grasses; 20 to 30 inches ppt.
Surface Layer	1 to 0 inches of white fir and ponderosa pine needles, over 0 to 4 inches; dark grayish brown loam, platy and granular structure, slightly hard, pH 6.2.	1/2 to 0 inches; ponderosa pine and white fir needles and twigs, over 0 to 20 inches; reddish brown stony loam and very cobbly loam, granular and blocky structure, slightly hard and hard, pH 6.6 to 6.8.
Substratum	29 plus inches semi-hard tuff and tuff conglomerate.	
Rooting Depth (in.) to Underlying Material	20 to 40; tuff	20 to 40; basalt, tuff
Erosion Factor (K)	.43	.32
Max. Erosion Hazard	Moderate	Low to moderate
Soil Permeability	Slow	Moderately Slow
Drainage Class	Well drained	Well drained
Soil Manageability Class	2e	2ep
Group	II	
Forest Site Class	5 (3-4)	5 (3-4)
Range Site	Not placed in a range site.	Not placed in a range site.
Water Runoff Potential	Moderate	Slow
Watershed Sensitivity	5 (Moderate)	7
Hydrologic Soil Group	C	B
Available Water Capacity (AWC)	Low to Moderate	Low to Moderate
Upper 20 inches	2.9 inches	2.1 inches
Susceptibility to Burning Damage	Moderate	Moderate
Slope Stability Hazard	Low to Moderate	Low
Allowable Soil Loss	2 tons/acre/year	2 tons/acre/year
Chance of Seedling Survival	Moderate to high	Low
Rating for Timber Site	Fair (7)	Fair (1,3,7)
R-Value	0-30	30-60
Soil horizons in inches, USDA, Unified, AASHTO	0-4; Loam Unified: ML-CL, CL AASHTO: A-4, A-6 4-29; Clay loam, clay Unified: CL, CH AASHTO: A-6, A-7 29+; Weathered bedrock	0-14; Stony loam Unified: ML-CL, CL AASHTO: A-4, A-6 14-28; Very cobbly loam, very gravelly loam Unified: GM-GC, GC, ML-CL, CL AASHTO: A-2-4, A-2-6, A-4, A-6 28-35; Extremely gravelly clay loam Unified: GC AASHTO: A-2-6 35+; Weathered bedrock
Included Areas:	Included with these soils in mapping and making up about 25 percent of the acreage are the Merlin, Anatone, DeMasters, Bearskin, Mascamp, and Lamondi families, Bertag, deep, and Smarts, deep, families and unnamed soils similar to the Bertag family but shallower and over soft to hard tuff.	

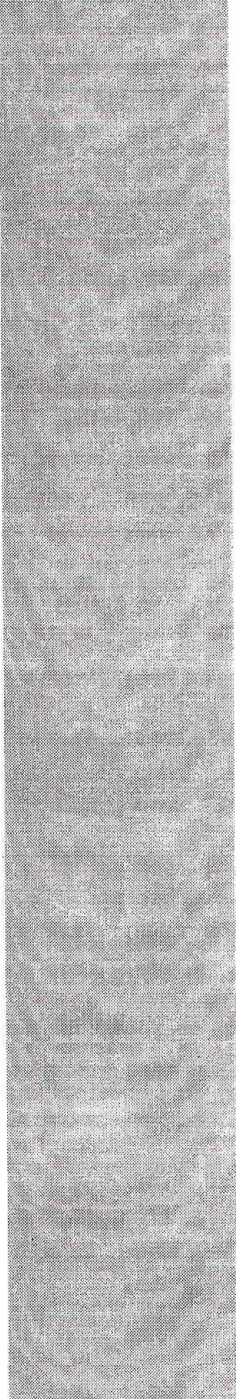
**210 LITHIC XERORTHENTS, MESIC-XEROFLUVENTS, MESIC-AQUOLLS ASSOCIATION,
0 to 20 percent slopes**

Map Unit Components	Lithic Xerorthents, mesic (35 percent)	Xerofluvents, mesic (20 percent)	Aquolls (20 percent)
Position, Slope, and Elevation	On sideslopes of narrow incised drainages and ridge crests adjacent to drainages; 1 to 20 percent slopes; 4300 to 5500 feet.	On lower sideslopes of alluvial drainages (subject to spring flooding); 1 to 10 percent slopes; 4300 to 5500 feet.	On concave areas of alluvial drainages (subject to flooding); 0 to 2 percent slopes; 4300 to 5500 feet.
Typical Vegetation and Precipitation (ppt)	Western juniper, low sagebrush, buckwheat, cheatgrass, other grasses; 14 to 18 inches ppt.	Western juniper, low sagebrush, big sagebrush, rabbitbrush, grasses; 14 to 18 inches ppt.	
Surface Layer	0 to 5 inches; brown and yellowish brown very cobbly loam and gravelly loam; platy and granular structure; slightly hard; pH 6.6 to 6.8.	0 to 37 inches; dark gray, grayish brown and light brownish gray silty clay loam, sandy loam, coarse sandy loam and loam; prismatic, blocky and massive structure; soft, slightly hard and hard; pH 6.8 to 8.0.	0 to 4 inches; dark grayish brown silty clay loam, granular structure, hard, pH 6.6. *SUBSOIL: 4 to 26 inches; dark grayish brown and grayish brown clay with yellowish brown mottles in lower part, prismatic and blocky structure, very hard, pH 6.8 to 7.0.
Substratum		37 to 60 inches; very pale brown sandy loam, platy structure, slightly hard, pH 7.4.	26 to 60 inches; gray and dark gray clay and stratified gravelly clay and very gravelly clay loam, massive, hard and very hard, pH 6.4 to 6.6.
Rooting Depth (in.) to Underlying Material	4 to 10; basalt	20 plus; alluvium, basalt	40 plus; alluvium, basalt
Erosion Factor (K)	Variable	Variable	Variable
Max. Erosion Hazard	Moderate to high	Moderate	Moderate
Soil Permeability	Moderate	Slow	Variable
Drainage Class	Somewhat excessively drained	Well drained	Poorly drained
Soil Manageability Class Group	3EDX III	2e	3eW
Forest Site Class	7 (non-commercial)	7 (non-commercial)	7 (non-commercial)
Range Site	1	18, 13	25
Water Runoff Potential	Rapid	Slow	Very Slow
Watershed Sensitivity	3 (Moderate)	6	7
Hydrologic Soil Group	D	C	D
Available Water Capacity (AWC) Upper 20 inches	Very Low	Low to High	Moderate to High
	0.6 to 1.5 inches	2.8 inches	3.0 inches
Susceptibility to Burning Damage	Low	Low	Low
Slope Stability Hazard	Low	Low	Low
Allowable Soil Loss	1 tons/acre/year	2, 3 tons/acre/year	3 tons/acre/year
Chance of Seedling Survival	Not Rated	Not Rated	Not Rated
Rating for Timber Site	Not Rated	Not Rated	Not Rated
R-Value	Not Rated	Not Rated	Not Rated
Soil horizons in inches, USDA, Unified, AASHTO	0-5; Variable Unified: Not Rated AASHTO: Not Rated 5+; Unweathered bedrock	0-60; Variable Unified: Not Rated AASHTO: Not Rated	0-60; Variable Unified: Not Rated AASHTO: Not Rated

210 LITHIC XERORTHENTS, MESIC-XEROFLUVENTS, MESIC-AQUOLLS ASSOCIATION (continued)

Included Areas:

Included with these soils in mapping and making up about 25 percent of the acreage are the Pass Canyon, Gwin, Roval, Bieber, Deven and Fordice families, unnamed fluvaquents, Rock outcrop, Rubble land and areas with steeper slopes.



Map Unit 210

257 SMARTS-MASCAMP FAMILIES ASSOCIATION, 40 to 60 percent slopes

Map Unit Components	Smarts family (50 percent)	Mascamp family (30 percent)
Position, Slope, and Elevation	On sideslopes of mountain uplands; 40 to 60 percent slopes; 5500 to 7500 feet.	On upper sideslopes, ridges and knolls of mountain uplands; 40 to 60 percent slopes; 5500 to 7500 feet.
Typical Vegetation and Precipitation (ppt)	White fir forest, or mixed conifer forest of white fir, ponderosa pine, incense-cedar, plus squaw carpet, snowbrush, serviceberry, manzanita, viola, mulesear, Ross's sedge, few grasses; 20 to 30 inches ppt.	Western juniper, low sagebrush, big sagebrush, rabbitbrush, mountain mahogany, Idaho fescue, cheatgrass, other grasses; 20 to 30 inches ppt.
Surface Layer	1/2 to 0 inches; ponderosa pine and white fir needles and twigs, over 0 to 20 inches; reddish brown stony loam and very cobbly loam, granular and blocky structure, slightly hard and hard, pH 6.6 to 6.8.	0 to 6 inches; dark grayish brown very cobbly loam, granular structure, slightly hard, pH 6.8.
Rooting Depth (in.) to Underlying Material	20 to 40; basalt, tuff	10 to 20; basalt, tuff
Erosion Factor (K)	.32	.37
Max. Erosion Hazard	High	High to very high
Soil Permeability	Moderately slow	Moderate
Drainage Class	Well drained	Well drained
Soil Manageability Class	3Ep	3Ed
Group	III	
Forest Site Class	5 (3-4)	7 (non-commercial)
Range Site	Not placed in a range site	9
Water Runoff Potential	Moderate	Rapid
Watershed Sensitivity	6 (Moderate)	4
Hydrologic Soil Group	B	D
Available Water Capacity (AWC)	Low to Moderate	Very Low to Low
Upper 20 inches	2.1 inches	1.2 to 2.5 inches
Susceptibility to Burning Damage	Moderate to High	Moderate
Slope Stability Hazard	Low	Low
Allowable Soil Loss	2 tons/acre/year	1 tons/acre/year
Chance of Seedling Survival	Low to Moderate	Not Rated
Rating for Timber Site	Fair (1,3,7,8)	Not Rated
R-Value	30-60	30-60
Soil horizons in inches, USDA, Unified, AASHTO	0-20; Stony loam, very cobbly loam Unified: ML, ML-CL AASHTO: A-4 20-28; Very gravelly loam Unified: SM-SC, SC AASHTO: A-4, A-6 28-35; Extremely gravelly clay loam Unified: GC AASHTO: A-2-6, A-2-7 35+; Weathered bedrock	0-12; Very cobbly loam, very gravelly loam Unified: SM-SC, SC AASHTO: A-4 12-19; Very gravelly clay loam Unified: SC AASHTO: A-2-6, A-6 19+; Unweathered bedrock
Included Areas:	Included with these soils in mapping and making up about 20 percent of the acreage are the Anatone, Bearskin, DeMasters, Lamondi, Bertag, Cavanaugh, Hades and Vipont families, Rock outcrop, Rubble land and unnamed soils similar to DeMasters family but not Pachic.	

259 SMARTS-MASCAMP-DEMASTERS deep FAMILIES ASSOCIATION, 20 to 40 percent slopes

Map Unit Components	Smarts family (40 percent)	Mascamp family (30 percent)	DeMasters family, deep (15 percent)
Position, Slope, and Elevation	On sideslopes of mountain uplands; 20 to 40 percent slopes; 5500 to 7500 feet.	On upper sideslopes, ridges and knolls of mountain uplands; 20 to 40 percent slopes; 5500 to 7500 feet.	On lower sideslopes and alluvial draws of mountain uplands; 20 to 35 percent slopes; 5500 to 7500 feet.
Typical Vegetation and Precipitation (ppt)	White fir forest, or mixed conifer forest of white fir, ponderosa pine, incense-cedar, plus squaw carpet, snowbrush, serviceberry, manzanita, viola, mulesear, Ross's sedge, few grasses; 20 to 30 inches ppt.	Western juniper, low sagebrush, big sagebrush, rabbitbrush, mountain mahogany, Idaho fescue, cheatgrass, other grasses; 20 to 30 inches ppt.	White fir forest, or mixed conifer forest of white fir, ponderosa pine, incense-cedar, plus few quaking aspen, snowbrush, service- berry, forbes, Ross's sedge, few grasses; 20 to 30 inches ppt.
Surface Layer	1/2 to 0 inches; ponderosa pine and white fir needles and twigs, over 0 to 20 inches; reddish brown stony loam and very cobbly loam, granular and blocky structure, slightly hard and hard, pH 6.6 to 6.8.	0 to 6 inches; dark grayish brown very cobbly loam, granular structure, slightly hard, pH 6.8.	1-1/2 to 0 inches of ponderosa pine and white fir needles and twigs, over 0 to 14 inches; brown loam, granular and blocky structure, soft, pH 5.6 to 6.4.
Rooting Depth (in.) to Underlying Material	20 to 40; basalt, tuff	10 to 20; basalt, tuff	40 plus; basalt, tuff, alluvium
Erosion Factor (K)	.32	.37	.32
Max. Erosion Hazard	Moderate	Moderate to High	Moderate
Soil Permeability	Moderately slow	Moderate	Moderately slow
Drainage Class	Well drained	Well drained	Well drained
Soil Manageability Class Group	2ep II	3Ed	2e
Forest Site Class	5 (3-4)	7 (non-commercial)	4 (2-3)
Range Site	Not placed in a range site	9	Not placed in a range site
Water Runoff Potential	Slow	Rapid	Slow
Watershed Sensitivity	7 (Moderate)	5	7
Hydrologic Soil Group	B	D	B
Available Water Capacity (AWC) Upper 20 inches	Low to Moderate	Very Low to Low	Moderate to High
Susceptibility to Burning Damage	2.1 inches	1.2 to 2.5 inches	3.4 inches
Slope Stability Hazard	Moderate	Moderate	Low to Moderate
Allowable Soil Loss	Low	Low	Low
Chance of Seedling Survival	2 tons/acre/year	1 tons/acre/year	3 tons/acre/year
Rating for Timber Site R-Value	Low to Moderate	Not Rated	High
	Fair (1,3,7)	Not Rated	Good
	30-60	30-60	30-60

259 SMARTS-MASCAMP-DEMASTERS deep FAMILIES ASSOCIATION (continued)

Soil horizons in inches, USDA, Unified, AASHTO	0-20; Stony loam, very cobbly loam Unified: ML, ML-CL AASHTO: A-4	0-12; Very cobbly loam, very gravelly loam Unified: SM-SC, SC AASHTO: A-4	0-14; Loam Unified: ML-CL, CL AASHTO: A-4, A-6
	20-28; Very gravelly loam Unified: SM-SC, SC AASHTO: A-4, A-6	12-19; Very gravelly clay loam Unified: SC AASHTO: A-2-6, A-6	14-37; Gravelly clay loam Unified: CL AASHTO: A-6
	28-35; Extremely gravelly clay loam Unified: GC AASHTO: A-2-6, A-2-7	19+; Unweathered bedrock	37-60; Extremely cobbly clay loam Unified: SC, CL AASHTO: A-6, A-7
	35+; Weathered bedrock		
Included Areas:	Included with these soils in mapping and making up about 15 percent of the acreage are the Anatone, Bearskin, Lamondi, Bertag, Cavanaugh, Hades and Vipont families, Rock outcrop and unnamed soils similar to DeMasters and Smarts families but no Pachic.		